

CLAIMS

I claim:

1. A device for transmitting from a borehole through the drilling fluid signals characteristic of measured data obtained while drilling the borehole, comprising:

5 a hydromechanical signal transmitter responsive to signals characteristic to the measured data for generating in the drilling fluid a coded series of pressure pulses characteristic of the measured data; and

a flow regulator for controlling the flow of drilling fluid through the signal transmitter in response to a pressure differential generated by a flow restrictor so that the
10 flow of drilling fluid through the signal transmitter is maintained substantially constant.

2. A borehole logging apparatus for deep well drilling, comprising:

a device for transmitting from a borehole through the drilling fluid to the earth's surface signals characteristic of measured data obtained while drilling,

15 an elongated housing which is adapted for insertion in the drilling fluid conduit of a drill string, includes at its influx end an entrance opening leading into a central housing conduit and has, downstream from the entrance opening, a sealing ring effecting a seal against the drill string,

said elongated housing further includes a bypass opening arranged downstream from
20 the sealing ring and leading from the central housing conduit into the drilling fluid conduit of the drill string, and, downstream from the bypass opening, a passageway connecting the central housing conduit with the drilling fluid conduit of the drill string,

a hydromechanical signal transmitter arranged in the housing and controlling a closure element for throttling at least in part the flow of drilling fluid through said passage way,

said closure element being repeatedly movable, at controlled intervals and in response to signals characteristic of measured data to be transmitted, from a passing position into a throttling position and back again into the passing position in order to generate in the drilling fluid a coded series of positive pressure pulses corresponding to said signals,

wherein the housing accommodates in its interior a flow regulator having a control piston, which controls the flow of drilling fluid through the bypass opening in response to the pressure differential generated by a flow restrictor and in response to the force of a spring in such manner that the part of the flow of the drilling fluid fed to the signal transmitter through the flow restrictor is maintained substantially constant, and the remaining excess of the flow of the drilling fluid is routed to the drilling fluid conduit via the bypass opening.

3. The borehole logging apparatus as claimed in claim 2, wherein the movement of the control piston is dampened hydraulically.

4. The borehole logging apparatus as claimed in claim 2, wherein the control piston has a throttling section disposed in the central housing conduit and controlling the cross-section of passage of the bypass opening, and a measuring section serving as a pressure sensor, the throttling section and the measuring section are interconnected by a tappet.

5. The borehole logging apparatus as claimed in claim 4, wherein the throttling section separates the bypass opening from the signal transmitter and is penetrated axially by a throttling conduit forming the flow restrictor.

6. The borehole logging apparatus as claimed in claim 4, wherein the measuring section is arranged in a chamber disposed upstream from the entrance opening in the housing, which chamber is divided into two compartments by the measuring section, whereof the first compartment, which is located at the end of the measuring section remote from the tappet, is connected to the drilling fluid conduit of the drill string through a connecting bore, and whereof the second compartment, through which the tappet extends receives therein a compression spring bearing against the measuring section with a spring force, and is connected to the end of the housing conduit downstream the throttling section through a longitudinal bore extending through the tappet and the throttling section.

7. The borehole logging apparatus as claimed in claim 6, wherein the flow through the connecting bore and/or the longitudinal bore is restricted in order to dampen hydraulically the movement of the control piston.